

TABLE VII.—Heights of rivers referred to zeros of gages.—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.	Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.						Height.	Date.	Height.	Date.		
<i>Colorado River.</i>									<i>Columbia River—Cont'd.</i>								
Ballinger, Tex.	Miles.	Feet.	Feet.	21-24	0.9	11-19	1.3	1.0	The Dalles, Oreg.	Miles.	Feet.	Feet.	29	4.3	1.9		
Austin, Tex.	400	21	1.9	1-31	1.2	1-31	1.2	0.0	Willamette River.	166	40	5.1	18	3.2	1.9		
Columbus, Tex.	214	18	1.2	1-31	5.5	14-23	5.8	0.5	Albany, Oreg. ¹²	118	20	15.6	12	4.2	1-3	7.9	11.4
<i>Red River of the North.</i>	100	24	6.0	1-11, 24-31					Portland, Oreg.	12	15	10.2	14	3.7	1	6.6	6.5
Moorhead, Minn. ¹	418	26							<i>Sacramento River.</i>								
<i>Columbia River.</i>									Red Bluff, Cal.	265	23	5.0	18, 19	2.8	16, 17	3.6	2.2
Umatilla, Oreg.	270	25	2.8	1-3	1.7	30, 31	2.2	1.1	Sacramento, Cal.	64	25	15.8	2	13.3	31	14.4	2.5

¹ Frozen entire month. ² Frozen for 8 days. ³ Frozen for 1 day. ⁴ Frozen for 11 days. ⁵ Frozen for 7 days. ⁶ Frozen for 16 days. ⁷ Frozen for 21 days. ⁸ Frozen for 24 days. ⁹ Frozen for 20 days. ¹⁰ Frozen for 9 days. ¹¹ Frozen for 28 days. ¹² 30 days only. ¹³ 28 days only. ¹⁴ Frozen for 14 days. ¹⁵ Gage broken. ¹⁶ Frozen for 18 days. ¹⁷ Frozen for 25 days. ¹⁸ Frozen for 2 days.

HAWAIIAN CLIMATOLOGICAL DATA.

By R. C. LYDECKER, Territorial Meteorologist.

Rainfall data for January, 1904.

Stations.	Elevation.	Amount.	Stations.		Elevation.	Amount.	Date.	Pressure at sea level.	Temperature.	During twenty-four hours preceding 1 p. m. Greenwich time, or 2:30 a. m. Honolulu time.				Prevailing direction.	Average cloudiness.	Sea-level pressures.	Total rainfall at 9 a. m., local time.	
			Max.	Min.						Maximum.	Minimum.	Mean.	Wind.					
HAWAII.																		
HILO, e. and ne.	Feet.	Inches.	Keomuku	...	Feet.	Inches.	0.10											
Waiakea	50	22.87	LANAI.		10	0.10												
Hilo (town).			OAHAU.															
Puueo.	85	27.61	Punahoa (W. B.), sw.		47	5.45												
Kaumana.	1,250	31.48	Kulaokahua (Castle), sw.		50	4.09												
Pepeekeo.	100	24.24	Makiki Reservoir		120	6.83												
Ilakalai.	200	28.30	U. S. Naval Station, sw.		6	3.78												
Honohina.	300	27.62	Kapiolani Park, sw.		10	3.19												
Puuhonua.	1,050	35.95	College Hills.		175	7.43												
Laupahoehoe.	500	24.67	Manoa (Woodlawn Dairy), c.		285	11.60												
Ookala.	400	19.05	Manoa (Rhodes Gardens)		360	15.14												
Kukuhiae.			Insane Asylum		30	5.47												
HAMAKUA, n.e.			School street (Bishop), sw.															
Kukaiakai.	250	15.03	Kamehameha School.															
Paauilo.	300	13.68	Kalihu-Uka, sw.		485	14.18												
Paauhau.	300	10.68	Nuuanu (W. W. Hall), sw.		50	7.20												
Honokaa (Mill).	425	12.24	Nuuanu (Wyllie street).		250	10.75												
Honokaa (Meinicke).	1,100	16.84	Nuuanu (Elec. Station), sw.		405	10.88												
Kukuhiae.	700	12.24	U. S. Experiment Station.		350	9.73												
KOHALA, n.			Kahu.		1,150	15.65												
Awini Ranch.	1,100	11.02	Kalihiu-Uka, sw.		1	30.04	73	68	76	70	64.7	78	ne.	2-3	6	30.09	30.00	
Niuli.	200	6.99	Laniakea (Naahuina).		2	30.05	74	68	79	72	66.7	81	ne.	1-0	5	30.08	30.00	
Kohala (Mission).	521	6.63	Tantalus Heights (Frear).		3	30.07	72	65	79	70	66.0	77	ne.	3-1	3-5	30.10	30.01	
Kohala (Sugar Co.).	270	6.56	Waimanalo, ne.		4	30.06	72	66	77	71	62.7	71	ne.	2-4	4	30.11	30.03	
Hawi Mill.	700	6.38	Maunawili, ne.		5	30.09	72	66	75	70	62.5	69	ne.	1-0	1	30.09	30.01	
Puakea Ranch.	600	4.18	Kaneohe.		6	30.14	70	65.5	78	70	63.5	73	ne.	3-0	3	30.15	30.06	
Puuhue Ranch.	1,847	8.18	Ahuinuanu, ne.		9	30.11	65	62	77	69	62.7	72	ne.	2-0	2	30.17	30.10	
Waimea.	2,730	16.52	Kahuku, n.		10	30.04	59	57	79	63	60.5	75	nne.-se.	1-0	1-1	30.13	30.03	
KONA, w.			Waialua.		11	30.05	66	64	77	58	59.7	78	sw.	0	0-4	30.07	29.96	
Huehue.	2,000	3.15	Wahiawa.		12	30.09	68	60	75	65	61.0	73	sw.-nne.	0-2	10-2	30.10	29.99	
Holuaoa.	1,350	1.45	Ewa Plantation, s.		13	30.10	70	64	75	66	57.5	66	ne.	1-1	1-4	30.13	30.04	
Kaukahoku Leheula.			U. S. Magnetic Station.		14	30.13	71	64	78	63	52.5	71	ne.	2-0	7-3	30.17	30.10	
Kainaliu.			Waipahu.		15	30.10	70	65.5	76	69	61.0	69	ne.	1-4	6	30.17	30.08	
Kealakekua.	1,580	4.41	Moanalua.		16	30.05	69	65	75	67	62.7	74	ne.	2-4	4	30.11	30.02	
Napoopo.	25	2.10	Pacific Heights.		17	30.01	73	64.5	76	69	63.7	75	ne.	2-4	5	30.08	30.01	
Hoopuloa.			KAUAI.		18	30.06	71	64.5	76	60.5	68	66.7	75	ne.	4-6	4	30.07	29.97
Puuwaawau Ranch.			Lihue (Grove Farm), e.		19	30.02	71	64.5	75	69	61.3	70	ne.	5-2	4-7	30.11	30.01	
Huehue.			Lihue (Molokoa), e.		20	30.04	70	64	76	70	59.7	66	ne.	6-2	4	30.08	30.02	
KAHU, se.			Lihue (Kukaua), e.		21	30.01	70	62	73	68	59.0	66	ne.	5-2	4	30.08	30.01	
Kahuku Ranch.	1,680	4.61	Kelaila.		22	29.97	70	63.5	76	70	58.5	68	ne.	2-0	2-4	30.04	29.96	
Honuapo.	15	3.61	Kealia, e.		23	30.00	70	63	67	60.5	66	66	ne.	1-0	3-8	30.02	29.94	
Naalehu.	650	5.15	Kilauea (Plantation), ne.		24	30.00	70	63	67	62.5	74	66	ne.	2-0	3-5	30.08	29.95	
Hilea.	310	3.90	Hanalei, n.		25	29.95	69	62.5	74	67	58.3	67	nne.	4-1	7-4	30.04	29.93	
Pahala.	850	2.65	Waiofa.		26	29.91	69	63	75	68	59.3	69	n.	1-2	4	29.99	29.90	
Moaula.			Haena.		27	29.89	66	62.5	72	67	59.0	69	nww-nne.	1-5	6	29.96	29.86	
Volcano House.	4,000	16.19	Waiauwa.		28	29.88	67	66.5	72	66	62.5	85	mne.	2-0	6	29.92	29.81	
PUNA, e.			Eelele.		29	29.98	63	62	77	64	66.0	87	sse.	1-0	7-4	30.01	29.86	
Olaa, Mountain View (Russell).	1,530	48.75	Waihawa (Mountain).		30	30.00	63	62	77	62	62.3	80	calm.	0	1-8	30.05	29.96	
Olaa, Plantation (Mill).	210	31.77	McBryde (Residence).		31	29.95	65	64	78	62	62.7	80	se.	0	5	30.06	29.95	
Kapoho.	110	19.69	Lawai, w.															
Pahoa.	600	28.31	Lawai, e.															
MAUI.			Koloa.															
Lahaina.			Kawai Beach.		100	3.38												
Waipapa Ranch.	700	2.96	<i>Delayed December reports.</i>		3.86												5.76	
Kaupo (Mokulau), s.	285	17.19	U. S. Experiment Station.		2.29													
Kipahulu, s.	308	14.30	Kipahulu Mill.		3.61													
Hana.			Kalihula.		2.16													
Nahiku, ne.	850	31.21	Kapoho.		1.55													
Nahiku.	1,600	45.51	Pahala.		2.80													
Haiku, n.	700	11.90	Ookala.		2.80													
Kula (Erehwon), n.	4,500	11.21	Kaumana.		7.64													
Kula (Waiakoa), n.	2,700	7.49	Napoopo.		0.00													
Puonomelei, n.	1,400	16.17	Honokaa.		1,100													
Paia.					3.62													
Haleakala Ranch.	2,000	24.16	Puonomelei.		7.74													
Wailuku, ne.	250	2.50	Kula (Erehwon).		1.00													

NOTE.—The letters n, s, e, w, and c

mean dew-point, 61.7° ; normal, 62.6° ; mean absolute moisture, 6.05 grains per cubic foot; normal, 6.27 grains.

Rainfall, 5.76 inches; normal, 3.10 inches; greatest rainfall in one day, 0.92 inch (from 9 a. m., 23d, to 9 a. m., 24th); rain record days, 28; normal, 16; total at Luakaha, 17.71; normal, 9.15; at Kapiolani Park, 3.19; normal, 2.01.

The artesian well water level rose from 33.40 to 33.93 feet above mean sea level. January 31, 1903, it stood at 35.06. The average daily mean sea level for the month was 9.77, the assumed annual mean being 10 feet above datum. For January, 1903, it was 9.71.

Trade wind days, 25 (4 nne.); normal, 14; average force of wind during daylight, Beaufort scale, 1.7; average cloudiness, tenths of sky, 4.2; normal, 4.4.

Approximate percentages of district rainfall as compared with normal: Hawaii, Hilo district, 227 per cent; Hamakua, 181; Kohala, 131; Waimea, 427; Kona, 120; Kau, 148; Puna, 296; island of Maui, 323; island of Oahu, Honolulu district, 201; Nuuanu, 202; Koolau, 144; Ewa, 80; island of Kauai, variable from 35 at Waiawa to 170 at Hanalei.

The heaviest monthly rainfall reported was at Olaa, 1530 feet elevation, 48.75 inches. The heaviest 24-hour rainfalls were at Waimea, 6.55 inches on the 27th; Olaa Mill, 6.40 inches on the 5th; Pahoa, 6.10 inches on the 27th. All on the Island of Hawaii.

Temperature table for January, 1904.

Stations.	Eleva-tion.	Mean max.	Mean min.	Cor. av'ge.	Highest.	Low-est.
	Feet.	°	°	°	°	°
Hilo	40	73.6	63.0	67.6	81	59
Pepeekeo	100	75.0	65.6	69.6	79	63
Olaa Mill	210	81.0	61.0	70.3	85	57
Kohala	521	74.0	63.6	68.1	81	61
Waimea	2,730	72.6	56.0	63.6	82	50
Volcano House	4,000	67.5	48.7	57.4	72	44
Waiaikoa	2,700	75.0	54.7	64.2	80	51
Keonuku	10	78.3	71.2	74.1	86	66
Kinau	50	75.6	67.6	70.7	79	51
Ewa Plantation	60	79.2	64.2	71.0	82	57
United States Experiment Station	350	77.9	65.9	71.2	81	59

Kohala, dew-point, 63.0° ; relative humidity, 80.4 per cent.

Ewa plantation, dew-point, 62.0° ; relative humidity, 71 per cent; barometer mean, 30.01.

The record for the month was an exceptional one. Tem-

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perature, pressure, rainfall, and trade wind days all considerably above the January normal; the barometer especially so, making the seventh consecutive month of pressure above the normal.

Activity of the crater Halemaumau in Kilauea ceased toward the end of the month.

Lunar halo 1st; lightning to the southeast on the evening of the 2d; bright afterglow on the 9th; dew on five mornings.

Reported from other stations: Hilo, thunder and lightning 3d and 4th; slight earthquake on 23d at 9:40 p. m. Pepeekeo, thunder and lightning on 2d, 5th, and 26th; heavy snow on mountains, 5th to 11th and 22d to 31st; heavy earthquake, 23d at 9:38 p. m.; high surf 1st to 27th; winds from north to east all the month; dew 3 mornings; average cloudiness, 7.8; mean force of wind, 1.9. Kohala, earthquake on 23d at 9:48 p. m.; trade winds throughout. Waimea, earthquake on 23d; winds variable, from calms to strong northeast gales, 19th and 20th; heavy rain 24th to 28th, inclusive, 14.57 inches falling; heavy snows on Mauna Loa and Mauna Kea; bright afterglow on 7th.

CLIMATOLOGICAL DATA FOR JAMAICA.

Through the kindness of Mr. H. H. Cousins, chemist to the government of Jamaica and now in charge of the meteorological service of that island, we have received the following table in advance of the regular monthly weather report for Jamaica:

Comparative table of rainfall for January, 1904.

[Based upon the average stations only.]

Divisions.	Relative area.	Number of stations.	Rainfall.	
			1904.	Average.
Northeastern division	Per cent.	25	Inches.	Inches.
Northern division	22	24	5.88	6.93
West-central division	26	49	2.60	3.44
Southern division	27	24	3.01	2.66
Means	100	32	2.17	1.81
		201	3.42	3.71

The rainfall for January was, therefore, below the average for the whole island. The greatest fall, 19.28 inches, occurred at Mount Holstein in the northeastern division, while 0.01 inch fell at Plumb Point lighthouse in the southern division.